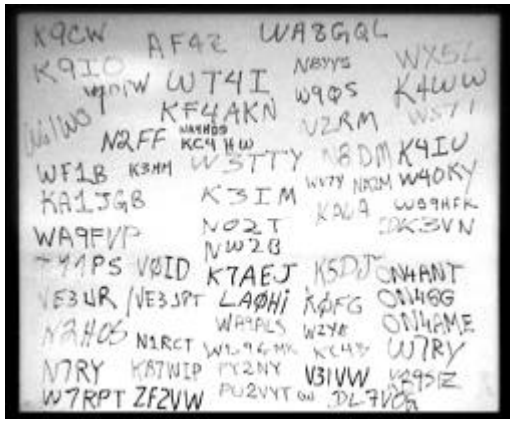
The New
RTTY *Journal* ©

P.O. Box 236, Champaign, IL 61824-0236 Volume 48, Number 2, June 2000 $5.00

Dayton 2000 RTTY Gathering

Fantastic RTTY Banquet Dinner Gatherings
DX/Contesters Dinner was hosted by Ron Stailey, K5DJ.
Photo by Don Winn, AF4Z

Congratulations to Raj, VE6RAJ, and Carol Singh, who made Dayton their Honeymoon.
Photo by Bill Hellman, NA2M



Many calls at the RTTY Journal Hospitality suite(s).

Lively RTTY Forum — Guest Panel, Left to Right:
Bob Stewart, ZL2AMI; Bruce Lifter, WT4I;
Raj Singh, VE6RAJ; Leo Fry, K8PYD;
Shelby Summerville, K4WW; Jay Townsend, WS7I
Panel Moderator: Frank Fallon, N2FF (Not Pictured)
Photo by Don Winn, AF4Z

RTTY Contest Schedule — Summer 2000

Date & Time		Contest	Date & Time		Contest
7/15	1800 to	North American	8/19	0000 to	SARTG RTTY
7/16	0600	QSO Party	8/20	1600	
7/29	0000 to	Russian World	8/26	1200 to	SCC RTTY
7/30	2400	Wide RTTY	8/27	1200	

Dates and times subject to change.

Updated information available at:

LA9HW RTTY Page: http://home.sn.no/~janalme/RTTY.html
Jim's Gazette: http://www.n2hos.com/digital
SM3CER Contest Service: http://www.sk3bg.se/contest
ARRL: http://www.arrl.org
BARTG: http://www.bartg.demon.co.uk
The New RTTY Journal: http://www.rttyjournal.com

OR — The New RTTY Journal will airmail a printed copy to you. *For each contest,* send $3.00 for U.S., Canada, or Mexico destinations or $4.00 to other countries. Please allow 3 weeks for processing and delivery.

The New
RTTY *Journal*©

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K9GWT
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Hits & Misses

Bill Henry, K9GWT
k9gwt@rttyjournal.com

One more year and the Dayton Hamvention has come and gone again. This year's gathering at the Holiday Inn was our largest in many years. Due to a lot of hard work by Joe (KB9SIZ), Dale (W6IWO), and Ron (K5DJ), it all came off with very few glitches. While overall attendance at the hamvention itself was down (how much is a matter of opinion), attendance by RTTY folk was up from past years. We had record attendance at both the Friday and Saturday night dinners and the largest block of rooms we've had for years. The food was even better than last year (if that's possible) and everyone had a good time at the after-hours hospitality suite.

Even the predicted highway detour disaster didn't turn out to be nearly as bad as predicted. While seats on the bus were limited, the bus idea worked. Dale and I met with the Holiday Inn manager during our stay and the manager has promised that the hotel will rent a larger bus just for us next year. That's good news and you can bet that bus information will be included on next year's registration. This year, the RTTY group rented 88 rooms. Next year, we have asked that the hotel set aside 110 rooms for us. Dale says he thinks he can fill them!

I can also report that, as a commercial exhibitor at the show (RTTY Journal and HAL), interest in and sale of RTTY-related items was up compared to previous years. The RTTY group continues to grow. The RTTY forum on Saturday afternoon had record attendance this year for our panel discussions about RTTY DX and RTTY Contest issues. ARRL Director and RTTY Contester Frank Fallon (N2FF) was our moderator. Our distinguished panel featured Jay Townsend (WS7I), Shelby Summerville (K4WW), Leo Fry (K8PYD), Raj Singh (VE6RAJ), Bruce Lifter (WT4I), and Bob Stewart (ZL2AMI). The discussion was lively and enjoyed by all.

Contests and Flaming: One of the topics brought up at the Dayton RTTY Forum had to do with single-operator contest stations using more than one radio. The debate was whether or not this was permitted by existing rules or if new categories were required. The discussion was ardent but all were in good humor at the time. But, the topic has since stirred up a hornet's nest on the WF1B Reflector. Tempers flared and several RTTY'ers went away pretty steamed. I don't want to take sides in this argument but I must say that some of the flaming was out of character for our RTTY group. I've been involved with amateur RTTY for 40 years and it's always been a collection of very nice and reasoned people. The 75 meter crowd or the 2 meter crowd sometimes get obnoxious but not our RTTY folks. I think the real-time and fast-response nature of the internet might have been a major contributor to last month's fiasco.

I'd like to suggest we all consider our comments BEFORE we push the SEND MESSAGE icon! Sometimes, I get pretty steamed up and have written some dandy "you dumb so-and-so" letters. Fortunately, I have actually sent very few of them. I have a rule that if I feel I have to write such a letter, I MUST let it sit overnight before sending it. It is truly amazing how my perception can change after only 7 or 8 hours. Some of my "prized prose" sounds pretty stupid when I read it the next day. Usually, I end up re-writing the whole letter, almost always in a softer tone. Once in a while, I get even more steamed — but then I let that sit for another 24 hours! I find that it IS great therapy to sit down and write a "you dumb-so-and-so" letter, but DON'T send it until after you've reviewed it the next day.

For you fellows who got involved in the flaming, I suggest that maybe it's time to just go fishing. Drown a worm, lay back, and ponder the clouds. With any luck, the fish won't be biting. Try this for a day or two — or maybe a week or two. THEN — come back and get on RTTY — we need you! I think you'll find that RTTY will be a lot more fun if we relax and enjoy it.

See you next month.

73 de Bill, K9GWT

What Is My RTTY Frequency?

Bill Henry, K9GWT
k9gwt@rttyjournal.com

This is the 3rd article in a series about HF RTTY fundamentals. In November 1999, I discussed RTTY shifts, tones, polarity, and so on. In the February 2000 issue, we talked about how we generate an HF FSK RTTY signal and the difference between "direct" and "indirect" FSK (a.k.a FSK vs. AFSK). This month, I'd like to tackle the issue of how to specify the radio frequency of an HF data signal.

Carrier Frequency:
Way back when — when we used on/off keying for CW and amplitude modulation for voice — we all knew our signal frequency. It was the *carrier* frequency — the key-down frequency in CW or the no-modulation radio frequency on AM. When we first started to use HF RTTY in 1953, we used direct frequency shift modulation of a transmitter oscillator, creating "true FSK" modulation. We all used mechanical machines in those days, and "Mark" was the idle or "rest" state of these machines. It seemed obvious to all of us that our RTTY signal could be specified by measuring the frequency radiated when the TTY machine was at rest (Mark). We didn't have frequency counters in those days but could get within a few tens or hundreds of a cycle-per-second with a BC-221 frequency meter. These days, we specify frequency in "Hertz", read the frequency on a digital counter display, and very few of us even recall what a BC-221 looked like, much less how to use one! BUT — the Mark frequency remains the most easily measured and specified parameter of an HF RTTY signal. Just hook your counter input to a clip-lead antenna, hit the big switch on the transmitter, don't type on the RTTY keys, and read the numbers on the counter front panel (be sure to turn-off "diddle"!). It's hard to beat this for accuracy and simplicity, but it's rarely the same as reading the dial on your fancy, super-deluxe transceiver.

SSB Frequency:
In the late 1950's, use of SSB (Single Side Band) modulation revolutionized HF radio equipment. As I mentioned before, when SSB arrived, our transmitters and receivers became much more frequency stable, receiver filters sharper, and transmitters cleaner and smaller. The SSB emission is a variation of amplitude modulation — remove the center carrier and one sideband. Continuing what we did before SSB, the frequency of an SSB signal was still labeled as the carrier frequency — *if the signal had a carrier you could measure!* To this day, the frequency dial on amateur SSB equipment shows the "phantom" SSB carrier frequency. When we RTTY types started using "indirect FSK" (a.k.a "HF AFSK"), we put audio tones into the microphone jack, got on the air, and — of course — read those nice digital dials right down to one Hertz or so!

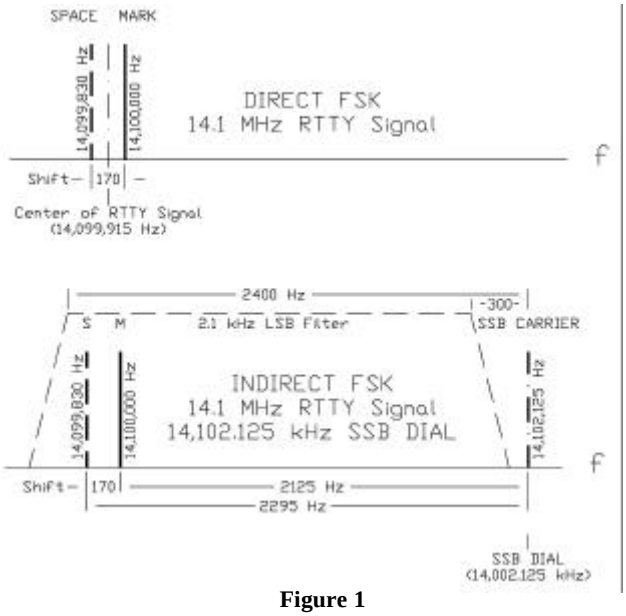


Figure 1

The first time we worked someone who still measured his Mark carrier frequency, the numbers didn't match. If we use LSB and audio tones, our actual Mark output will be lower in frequency than what we see on the SSB dial. In fact it is lower by exactly the Mark tone frequency — 2125 Hz in most cases.

RTTY traffic nets were the first to notice this difference and it soon became "SOP" to add or subtract 2125 from the indicated SSB dial to get on the net frequency. And then — some of us started using low tones. Now, we added or subtracted 1275 Hz; or maybe 2100 Hz, or maybe ??? Confused? Just wait, it gets better!

Channel Frequency and Occupied Bandwidth:
Military use of HF radio in the 50's and 60's brought with it a need to precisely specify network operating frequencies — and — avoid interference between stations if at all possible. This led to the concept of channelized communications. An HF communications channel has a center frequency and a maximum authorized emission bandwidth. All stations using this channel are assumed to be using similar modulation modes with similar bandwidths. The HF band is then broken up into clusters of frequency channels, each of which has a center frequency and maximum bandwidth. In the commercial world, these channels are given numbers and commercial HF radios don't typically need or have a real "frequency dial". It's a nice simple and well-ordered world! It certainly works for ship-to-shore communications. Look at CFR 47, Part 80 of the FCC Rules and Regulations. The marine bands are all precisely channelized. TOR (a.k.a. SITOR or AMTOR) channels are spaced 500 Hz apart and the maximum bandwidth of the signal is defined to be 300 Hz. There is a 200 Hz "guard-band" between each TOR signal. In the marine service, the idea works well. However, when applied "in general", problems develop. Anybody who has ever tried to bring up a ham transceiver on a military or commercial frequency knows of these problems all too well! Figure 1 shows an HF RTTY signal.

Let's look at how its frequency might be specified. Consider a 20 Meter RTTY signal with Mark set to 14,100,000 Hz (yeah, I know this is a beacon frequency, but this all "in theory" anyhow). Using "LSMFT" convention and 170 Hz shift, the Space signal will be at 14,099,830 Hz. If we hook a counter up to read the transmitter's output frequency, it will show "14,100,000 Hz" when the TTY circuit is in the Mark or rest state. But, suppose that the RTTY signal is generated via tones into a LSB trans-

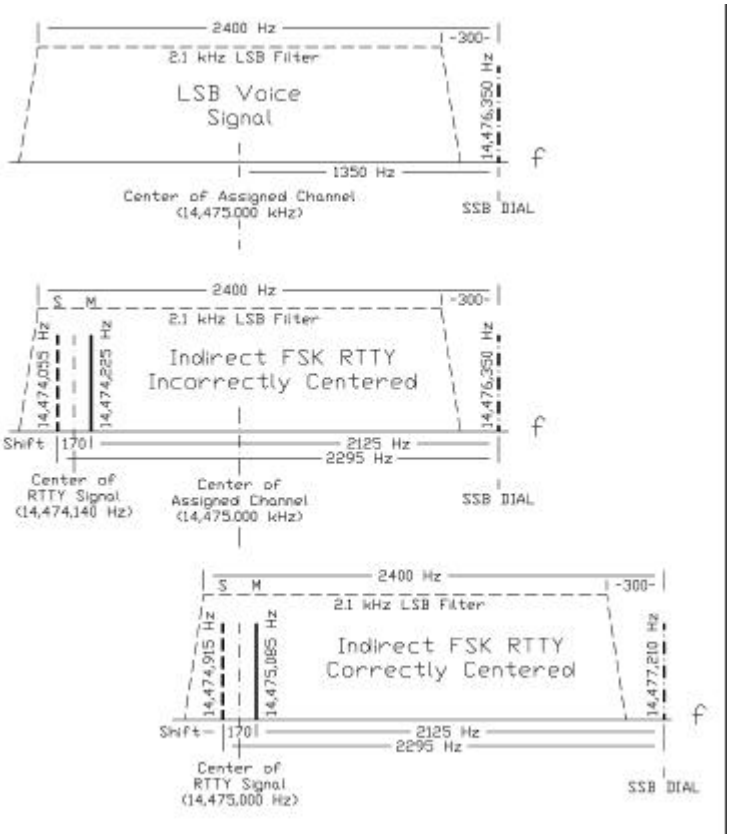


Figure 2

mitter. What's the SSB transceiver dial read? If it's *very* accurate, it shows 14,100,000 plus 2125 Hz = "14,102,125 Hz." Now, if I'm in MARS, what is my RTTY frequency? It's the center of the occupied bandwidth — half-way between Mark and Space = 14,099,915 Hz. Same signal, but the "frequency" could be said to be "14,100,000 Hz", "14,102,125 Hz", or "14,099,915 Hz". Isn't science wonderful?

Consider the situation shown in Figure 2. You're working LSB on an ARMY MARS net and somehow you manage to get on the assigned net frequency of 14,475.000 kHz (zero-beat net control was my method — he is supposed to know how to get on freq!). Your transceiver dial says 14,476.35 kHz). Now net control says shift to RTTY using 170 Hz shift, same channel, LSMFT polarity. You pull out the microphone, plug-in the TTY audio tones, and away you go. Or so you thought! Net control calls and you hear his tones but they sure aren't 2125 and 2295 Hz. What's wrong? Easy. Your amateur transceiver is still set for a phantom carrier frequency of 14,476,350 Hz. When you were on LSB, the center frequency was 1,350 Hz lower — at 14,475,000 Hz. Changing to RTTY using high tones, you now have Mark at 14,476,350 - 2,125 = 14,474,225 and Space at 14,476,350 - 2,295 = 14,474,055 Hz. The center frequency of your RTTY signal is 14,474,140 Hz, not at the assigned 14,475.0 kHz channel frequency. You need to increase your transceiver frequency by 860 Hz so that the dial reads "14,477.21 kHz". Wow, where did *that* number come from? It's the difference between the center offset from the carrier is LSB (1350 Hz) and the offset of the center of the RTTY signal (2210 Hz). BUT, don't ask, just do it!

Complex Data Modes:

By now, it should be obvious that if we are all using plain old FSK RTTY, it is a LOT simpler if we all just specify the Mark frequency and periodically hook up a counter and confirm our dial calibration. Why would *anyone* want to mess with channel or center frequency? Because, not all of our data modes use simple two-tone FSK is why. Consider 4-tone CLOVER-II. What tone do you measure as the "CLOVER Frequency" — and how do you measure it? The short answer is you can't easily measure the frequency of one tone. Consider 300 baud FSK. What is the operating frequency? Hmm. It turns out that the only consistent way to specify the HF operating frequency of these signals is to look at the occupied bandwidth and the center of that occupied bandwidth.

FSK vs. AFSK:

You knew this was going to come up again, didn't you? All of the frequency and dial reading discussions apply equally to receiving and transmitting when using an SSB mode. This discussion also applies when you use an FSK mode on the radio, but with a complication. In some radios (not all), selecting the FSK mode also adds-in a new offset so that the received RTTY tones are centered on the radio's IF filters. Usually, this also means that the dial reading is also changed. But just what the dial reads is not at all consistent between radios (eg, the TS-930 vs the TS-940 differences discussed below). If you use FSK, use a counter to measure the actual transmitted frequency and then determine the dial correction factor for your radio. Also, if you can send a continuous Space tone, it might be interesting to see if your radio really does send standard 170 Hz shift or something else — 150 to 250 Hz have been found! Finally, it is also good to see if your rig is really transceive when using FSK mode — does it send and receive on the same frequency. Some rigs have a lot of trouble here — my TS-820, for example. This is hard to check. I suggest that you get a friend to work with you and have him use LSB (not FSK). Get on the air and get BOTH stations transmitting exactly on frequency — both of you use a counter. Look at your receive tuning error. It may surprise you. If it's a lot, you may want to send the radio back for alignment as this is a BIG problem for operation.

Calibration:

No discussion of HF operating frequency can be complete without talking about calibration accuracy. Boy is this a problem! We have six HF transceivers here at HAL. They all have bright, beautiful, and wondrous digital fre-

quency dials. Some of the radios even show the frequency in 1.0 Hz digits! Don't assume that what you see is actually what you get. In fact, it is not at all unusual for the frequency dials of even commercial grade HF radios to be off calibration by 10, 20, 50, or even 100 Hz. Likewise, just because your frequency counter "reads to within 0.1 Hz", don't go setting up shop to compete with WWV. Frequency counters are often 100 Hz or 200 Hz out of calibration, particularly that "great bargain" you found at the hamfest last summer. And, let's not forget the handy "FSK mode" on some of our radios. What does the digital dial show in these modes? It depends on the radio model! In "FSK Mode" my TS930 dial showed the Space frequency; the TS940 dial shows the Mark frequency. And my TS-130 dial shows the suppressed carrier frequency (LSB — no FSK mode included)! Are we having fun yet? Bottom line — if in doubt, connect a dummy load, hook a wire to your counter, send some Mark, and *measure* your frequency.

Figure 3 shows a typical set-up to measure your actual RTTY transmit frequency. The idea is to transmit only a Mark signal and use a counter to measure the *actual* signal you are sending. Use a good counter of known accuracy — check it against WWV, for example. I find that HF counters that work up to 30 MHz or so tend to give more stable HF measurements than super VHF and UHF counters that work up to 500 MHz or so. Be sure you are sending only a Mark signal (no diddle) and turn the transmitter on. Read the counter and compare that to the dial on your transceiver. Believe the counter! Most radios are 10 to 100 Hz off, some even more than that. Jot down a correction factor and use it if you have to be on-frequency. Here are some formulas that may come in handy:

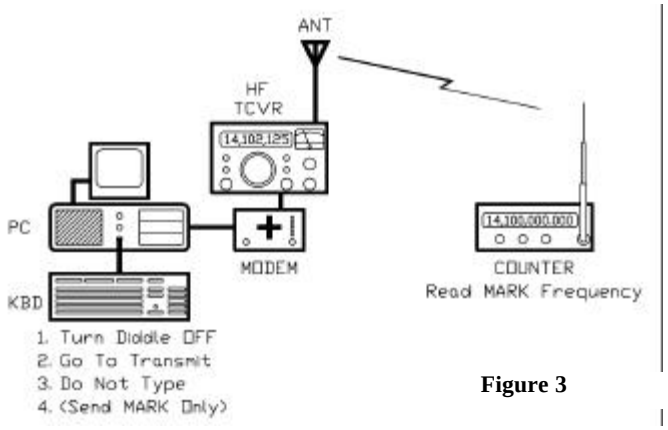


Figure 3

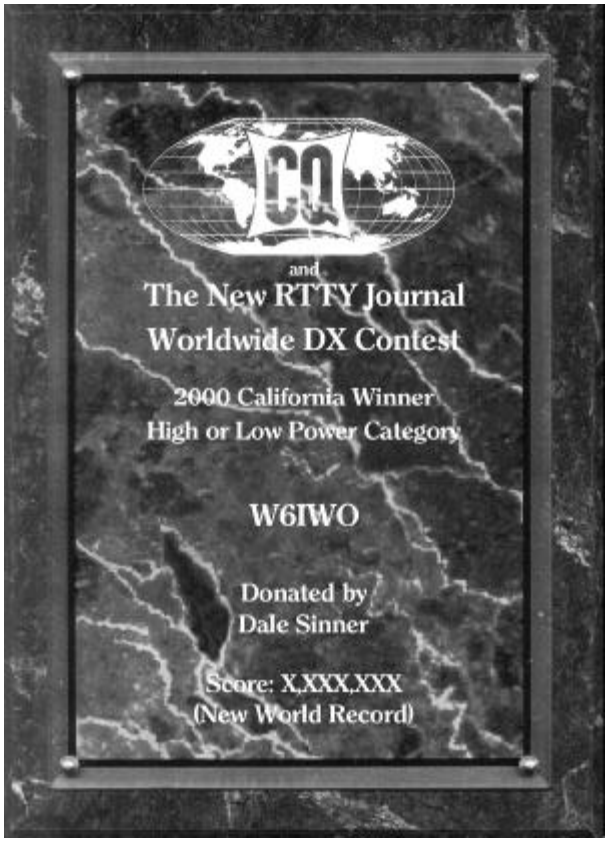
Let Fm = MARK Audio Tone Frequency
Fs = SPACE Audio Tone Frequency
S = SHIFT = Fm - Fs
Fc = CENTER Frequency = Fm + S/2

If Fm(HF) = MARK radio frequency;
F(LSB) = LSB Dial Frequency = Fm(HF) + Fm
F(USB) = USB Dial Frequency = Fm(HF) - Fm

If Fc(HF) = CENTER radio frequency,
F(LSB) = LSB Dial Frequency = Fc(HF) + Fc
F(USB) = USB Dial Frequency = Fc(HF) - Fc

Common numbers:

				Specify MARK Radio Frequency		Specify Center Radio Frequency	
Fm	Fs	S	Fc	LSB Dial	USB Dial	LSB Dial	USB Dial
2125	2295	170	2210	Fm(HF)+2125	Fm(HF)-2125	Fc(HF)+2210	Fc(HF)-2210
2125	2325	200	2225	Fm(HF)+2125	Fm(HF)-2125	Fc(HF)+2225	Fc(HF)-2225
2100	2300	200	2200	Fm(HF)+2100	Fm(HF)-2100	Fc(HF)+2200	Fc(HF)-2200
1615	1785	170	1700	Fm(HF)+1615	Fm(HF)-1615	Fc(HF)+1700	Fc(HF)-1700
1275	1445	170	1360	Fm(HF)+1275	Fm(HF)-1275	Fc(HF)+1360	Fc(HF)-1360
1200	1400	200	1300	Fm(HF)+1200	Fm(HF)-1200	Fc(HF)+1300	Fc(HF)-1300



New "California Run" Award

Dale Sinner, W6IWO
dsinner@tfb.com

I am inviting all California contesters to participate in this year's CQ/RJ WW RTTY contest. As I announced at Dayton this year, I will be sponsoring a plaque for the highest score in the single operator class. I am calling it the "California Run" award. Only California residents are eligible and only a single operator. It makes no difference whether you run low or high power. The purpose of this award is to encourage more California amateurs to participate in this contest. I know it is difficult to win any of the other awards from California because breaking the east coast wall is very difficult. However, I feel we have enough big guns in California to make a good run hence this award. So even if you can't win any of the other awards, you now have a chance at the "California Run" award.

I would like to see other states do this same thing, especially North Dakota where we all have problems finding a station to work. Maybe by sponsoring this award, it will inspire others to do the same. At any rate, I'll be looking to work as many stations as I can with hopes of maybe winning my own sponsored award. See all of you in the CQ/RJ WW RTTY contest.

73 — Dale Sinner, W6IWO

FT-1000D Digital Connections

Bob Harker, KC9UU
rjharker@email.msn.com

This past winter, I acquired a pre-owned FT-1000D transceiver. Much to my chagrin, I experienced problems when I attempted to connect my PCI-4000 (low serial number).

The RTTY jack on the back of the FT-1000D is a 4 pin Din connector with Shift(1), RX Out(2), PTT(3), and GND(4). There is no mention as to what kind of Shift pin 1 is. On a separate page and drawing, Shift is identified as FSK. This Din connector works fine if all you want to operate is RTTY and the TOR modes using FSK. Where does TX AFSK from the PCI-4000 go when operating Clover?

Pin 1 (Data In)	AFSK
Pin 2 (GND)	GND
Pin 3 (PTT)	PTT
Pin 4 (Data Out)	RX Out
Pin 5	Unused

After much gnashing of teeth, inventing new French words, and checking with the Service Department of AES, I found that I could operate the PCI-4000 board using the Packet 5 pin Din connector on the back of the FT-1000D. Four of the five pins are used. They are: Data In (1, AFSK), GND (2), PTT (3), Data Out (4, RX Out). No connection is made to pin 5.

In order for either of these Din connectors to be active, the respective buttons (RTTY or PKT) on the front panel must be pushed. I settled on the AFSK route using the PKT Din connector to operate all of the PCI-4000 modes.

By the way, the FSK signal input to the FT-1000D doesn't come out of the rig as pure FSK. Checking the schematic, one finds that Q3072-2 is an AFSK Generator and its output joins up with the Data In signal from the 5 pin Din connector.

2000 Dayton Hamvention

Don Winn AF4Z **Craig Ferris NR4E** **Jim Johnson KC4HW** **Orrin Delaney WA4HDS**

Sara Coates **Harry Coates WA8HC** **Dan Vernier WA8GQL**

Newlyweds Carol and Raj Singh, VE6RAJ

Eddie Schneider, W6/G0AZT
Presenting "DXpedition to TY1RY" at DX/Contester's Dinner

Eddie, W6/G0AZT, strips to his...
"native" TY1RY clothes

Ron Stailey, K5DJ
Host of the DX/Contester's RTTY Banquet Dinner

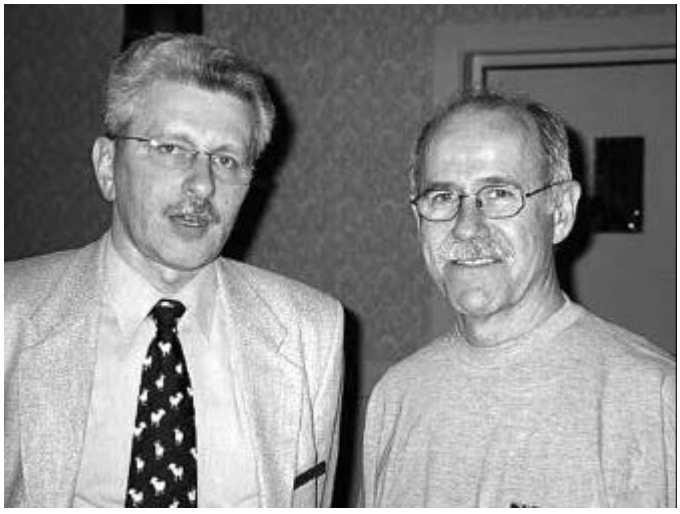
2000 Dayton Hamvention

Kathleen and Frank Fallon, N2FF
Photo courtesy of Bill Hellman, NA2M

Bill Hellman, NA2M Bob Stewart ZL2AMI
Photo courtesy of Bill Hellman, NA2M

Victor Santos, PY2NY Dale Sinner, W6IWO
Photo courtesy of Bill Hellman, NA2M

Margaret and Pete Maile, MI0BME
Photo courtesy of Bill Hellman, NA2M



Waldemar Kebsch, DK3VN Gerd Uhlig, DL7VOG
Photo courtesy of Bill Hellman, NA2M

Frank Fallon, N2FF
Moderator of the RTTY Forum Discussions

2000 Dayton Hamvention

RTTY Forum attendees were very interested in what the "Experts" had to say about RTTY DXing and Contesting.

Leo Fry K8PYD **Shelby Summerville K4WW** **Jay Townsend WS7I**

Bob Stewart, ZL2AMI

Bruce Lifter WT4I **Raj Singh VE6RAJ**

Raj Singh VE6RAJ **Leo Fry K8PYD**

Jean Paul Taillebois VE3JPT **Ray Hunter VE3UR**

2000 Dayton Hamvention

Ray Hunter VE3UR **Bill Henry K9GWT** **Joe Wittmer KB9SIZ**

Doug McDuff, W4OX **Orrin Delaney, WA4HDS** **Don Winn, AF4Z**

Photo courtesy of Don Winn, AF4Z

Al Hernandez, K3VN **William Beyer, N2WB**

Photo courtesy of Don Winn, AF4Z

Johan Van de Velde ON4ANT **Bruce Lifter WT4I** **JayTownsend WS7I**

Roy Maull N8YYS **Joe Coffman WB8TTZ**

Herman Mondelaers ON4AME **Geert Van de Velde ON4GG** **Ron Stailey K5DJ**

2000 CQ/RJ Worldwide WPX Contest Results

Eddie Schneider, W6/G0AZT

10 Meters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
LV5V	815	2401	419	1006019	WR+SA	Plaque
LU3FZW	674	1993	377	751361		
LW7EIC	602	1770	354	626580		
ED7FTR	654	1507	343	516901	EU	1st Spain
LT1A	547	1621	317	513857		
EO1I	634	1432	321	459672		1st Ukraine
Op: UT1IA						
EO6F	561	1387	327	453549		
Op: UX0FF						
UA6AJU	600	1349	317	427633		1st EU Russia
LZ2K	466	1177	308	362516		1st Bulgaria
Op: LZ2VL						
LW9EPB	434	1215	297	360855		
JA2IVY	420	1142	280	319760	JA	1st JA & JA2
OG9MM	436	1052	275	289300		1st Finland
I8UZA	310	793	214	169702		1st Italy
IK4ZIF	290	728	217	157976		
UW7U	294	715	208	148720		
Op: UT2UZ						
ON7NQ	277	736	201	147936		1st Belgium
JA1SJV	253	691	192	132672		1st JA1
CT2HMN	290	646	190	122740		1st Portugal
DL7VXX	241	612	191	116892		1st Germany
4X6UO	225	666	154	102564	AS	1st Israel
WI0WA	251	554	168	93072		1st USA & W0
JH1OAI	204	551	168	92568		
UN7FZ	210	564	141	79524		1st Kazakhstan
G0NWY	205	507	154	78078		1st England
LZ1CF	189	462	152	70224		
N1MGO	187	441	148	65268		1st W1
YU7AE	174	439	147	64533		1st Yugoslavia
AB8K	191	451	141	63591		1st W8
K4WW	142	355	113	40115		1st W4
SP8NR	133	358	111	39738		1st Poland
LZ1MC	135	335	116	38860		
IK2LOL	127	341	105	35805		
YL2GTD	105	268	93	24924		1st Latvia
SP4FOV	102	260	90	23400		
SP2JPG	98	264	83	21912		
OK2PMS	90	261	82	21402		1st Czech Rep.
SQ4CUM	142	377	37	13949		
OM3PR	77	187	71	13277		1st Slovakia
IK5WGK	67	172	64	11008		
RW0LZ	66	172	62	10664		1st AS Russia
LU6DAT	59	175	57	9975		
MOAEJ	87	107	81	8667		
CG2PIJ	45	110	39	4290	VE	1st VE & VE2
LZ4BU	33	84	33	2772		
PY1KS	18	53	16	848		1st Brazil
KM5TY	14	41	11	451		1st W5

15 Meters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
9A7R	692	1684	395	665180		Plaque
HA9OA	702	1723	410	635787		1st Hungary
S57IIO	631	1568	391	551779		1st Slovenia
T94MZ	643	1558	376	524858		1st Bosnia
CE8SFG	531	1567	309	479502		1st Chile
YU1NR	566	1398	358	450435		1st Yugoslavia
W7WW	524	1058	317	335386	USA	1st USA &W7
LU8HWD	423	1251	266	332766		1st Argentina
SN7N	463	1132	317	322959		1st Poland
Op: SP7NMW						
UA0CA	423	1130	277	281709	AS	1st AS Russia
EC2ADR	449	1037	292	272523		1st Spain
K8AA	390	910	271	246610		1st W8
K3GP	365	859	244	209596		1st W3
ON7UI	353	858	241	206778		1st Belgium
KG9X	337	743	247	183521		1st W9
4F3XX	318	942	202	171255		1st Phillipines
LZ2JA	356	796	234	167637		1st Bulgaria
YB5QZ	308	916	203	167353		1st Indonesia
OK2LC	310	750	233	157275		1st Czech Rep.
JA3EVZ	263	724	214	154936	JA	1st JA & JA3
SW1W	369	778	220	154044		1st Greece
Op: SV1CIB						
UX6F	332	726	217	141787		1st Ukraine
JG1GGU	232	627	182	114114		1st JA1
HC1JQ	237	703	154	108208		1st Columbia
OH5TF	260	571	183	104493		1st Finland
DL1LH	216	504	182	91728		1st Germany
JH7QXJ	200	563	154	86702		1st JA7
LY2CG	206	450	159	71550		1st Lithuania
ON4VV	185	443	149	66007		1st Belgium
WG7Y	233	348	160	55680		
IK2DHU	111	251	93	23343		1st Italy
SM7GXR	88	219	83	18177		1st Sweden
R3/DL7BO	95	205	79	16195		1st EU Russia
G0MTN	120	160	100	16000		1st England
JH1HRJ	55	140	52	7280		
RN3FT	77	99	69	6831		
SP9JCN	48	110	48	5280		
UA3DJY	5	9	5	45		

20 Meters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
S58T	825	2024	460	931040	WR+EU	Plaque
9A5W	842	2032	446	906272		1st Croatia
DJ7AA	797	1928	454	875312		1st Germany
9A8A	766	1872	398	670550		
G5G	722	1651	380	627380		1st England
CF3MM	674	1613	374	603262	VE	1st VE & VE3
UA4LCQ	673	1570	396	559548		1st EU Russia
LY1BZB	530	1197	316	340426		1st Lithuania
SP7IIT	468	1045	300	313500		1st Poland
IK2DPP	426	983	291	286053		1st Italy
UA9CKP	413	1175	265	280238		1st AS Russia
EA1AHY	455	1056	293	278467		1st Spain
T97M	401	918	269	222247		1st Bosnia
W6/G0AZT	448	753	263	198039		1st USA + W6
W3UR	363	826	239	197414		1st W3
DN1JC	370	793	256	182707		
NH6XM	309	911	184	167072		1st Hawaii
S51MM	311	664	217	144088		1st Slovenia
W6IWO	353	587	227	133249		
SM3LBP	291	655	215	126742		1st Sweden
UT7FP	273	588	196	115248		1st Ukraine
DL9MBZ	236	490	177	86740		
UA9ULU	195	516	158	81528		
8S3A	204	434	154	66836		
Op: SM3DXC						
RA0FF	155	399	130	51870		
UA6AHF	176	360	140	50400		
OZ1IRL	162	357	133	47481		1st Denmark
KF2XF	147	308	126	38808		1st W2
PR7AR	109	306	100	30600		1st Brazil
7K4QOK	103	271	95	25745		1st JA1
SP2GNB	97	209	82	17138		
K9MRQ	118	165	89	14685		1st W9
VE6JY	68	158	62	9796		1st VE6
DL9GMC	64	74	57	4218		
OG1UP	48	46	71	3266		1st Finland
Z31GB	19	51	19	969		1st Macedonia

40 Meters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
ED8WPX	573	3416	338	1154608		Plaque
Op: EA8PP						
UT9NA	415	1756	252	442512		1st Ukraine
F/OK1EE	421	1758	250	439500		1st France
UW5Y	342	1438	221	318682		
Op: US2YW						
SP4TXI	264	1092	186	203112		1st Poland
UR5FFC	247	1006	175	176050		
RK6CZ	208	854	143	122122		1st EU Russia
OK2EQ	187	772	141	108852		1st Czech Rep.
W3SE	240	656	143	93808		1st USA & W3
W4CI	236	624	141	87984		1st W4
4L1BR	101	578	29	16762		1st Georgia
PA3EWP	57	248	52	12896		1st Netherlands

80 Meters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
SP4CHY	285	1144	185	211640		Plaque
SM5FUG	238	954	167	159318		1st Sweden
ER1LW	240	944	157	148208		1st Moldavia
IK3SSJ	235	910	160	145600		1st Italy
CT1AOZ	214	916	158	144728		1st Portugal
I1COB	223	888	157	139416		
OK2PHI	214	844	148	124912		1st Czech Rep.
UA4CJJ	144	542	106	57452		1st EU Russia
ER5OK	40	164	38	6232		
OK1MGA	38	148	36	4752		
YL3FW	32	70	30	2100		1st Latvia

Multiple operators, multiple transmitters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
HG1S	2605	7663	613	4697419	WR+EU	Plaque (World)
Z30M	2463	6904	589	4066456		Plaque (EU)
KH7R	2116	7395	506	3741870	OC	First Hawaii
RK0AXX	1923	6669	513	3421197	AS	1st AS Russia
RM6A	2239	6084	535	3254940		
RI9C	981	3395	381	1293495		
RW4LYL	942	2533	354	896682		
DK0HUN	658	1936	302	584672		1st Germany

Operators:
HG1S: HA1DAE, HA1TJ, HA3UU, HA3OF, HA4WU, HA3MY, HA1DAE, HA1DAC, HA1YA, HA1WD
Z30M: Z31JA, Z31GX, Z31GB, Z32XA, Z32XX, Z32PT, Z33ZOD
KH7R: KH7R, KH7U, KH6ND, AH7R, AH6OZ, ND3A
RK0AXX: RA0AM, RU0AB, RV0AEV, RU0AM, RV0AR, RV0AU, RA0ALM, RV0AX
RM6A: RN6BN, RA6CM, RA6CO, RN6AA, RA6AX, RA6YY, UA6YDL, RX6BA
RI9C: UA9CDV, RU9CZE
RW4LYL: RA4LW, RA4LZ, RN4LP, RV4LM, RW4LE
DK0HUN: DL2YCA, DL5PW, DL7WS, DJ6WC, DL3PK

Multiple operators, two transmitters

Callsign	Q's	Pts.	WPX	Score	Record	Reward
P40K	3516	11943	703	8395929	WR+SA	Plaque (World)
HC8N	3423	11371	666	7573086		Plaque (SA)
WT4I	2205	4676	639	2987964		Plaque (NA)
YL4U	1884	5507	526	2896682	EU	Plaque (EU)
UT9F	1537	4420	492	2174640		1st Ukraine
OL5Q	1203	3787	423	1601901		1st Czech Rep.
SP5ZCC	756	2340	335	793900		1st Poland
OH7A	710	1693	329	556997		1st Finland
RK3RWL	747	1931	283	546473		1st EU Russia
SV1DNW	585	1550	268	415400		1st Greece
JA6ZPR	498	1339	276	369564	AS	Plaque (AS)
WB8SKP	324	676	171	115596		1st W8

Operators:
P40K: I2UIY, P43P, AI6V
HC8N: N5KO, W6OTC, K6AW, LU2DW, LW8EXF
WT4I: WT4I, K5DJ, K7WM
YL4U: YL2KF, YL3DW, YL3GDJ, R3BY
UT9F: UT9FJ, UR5FEL, UT0FT, UR5FGN, UR5FCZ, US-F-55, Eugen Melamed
OL5Q: OK1HRA, OK1FLC, OK1VSL, OK1FFU
SP5ZCC: SP5UAF, SQ5BPM, SQ5GVX, SQ5SJR, SP5TAT, 3Z5AAN, SQ5VJB
OH7A: OH7MN, OH7KNM
RK3RWL: ?
SV1DNW: SV1DNW, SV1DKL
JA6ZPR: JH6JSR, JR6CKX
WB8SKP: KA8CVE, WD8OWA, KC8GKK, WB8SKP

Multiple operators, single transmitter

Callsign	Q's	Pts.	WPX	Score	Record	Reward
UZ1Z	1356	3969	449	1782081	EU	Plaque (World)
KP2D	1343	3442	446	1535132	NA	Plaque (NA)
S50U	1055	3400	409	1390600		Plaque (EU)
AN1BD	1091	2863	422	1087367		1st Spain
OM2OOO	1109	3148	435	920790		1st Slovakia
UF3CWR	1036	2837	353	901214		1st EU Russian
YU7AL	808	2395	359	859805		1st Yugoslavia
RK9CZO	824	2698	330	801306		Plaque (AS)
W0DC	1038	2065	379	782635		Plaque (USA)
IK7XIV	754	2175	341	741675		1st Italy
VE3FJB	686	1964	318	624552	VE	Plq VE/1st VE3
KE7AJ	984	1940	349	609354		1st W7
3Z1V	667	2078	316	590993		1st Poland
KJ7TH	797	1587	281	445947		
AE9D	712	1504	295	399312		1st W9
OZ7HVI	462	1265	272	309672		1st Denmark
SP1PLA	318	935	181	169235		
YB3ZES	141	420	102	42840		Plaque (OC)
UZ7Z	138	405	103	41715		
N3IXR	137	283	94	26602		1st W3
W3DSX	126	267	91	24297		
T91EZC	75	221	68	15028		1st Bosnia
KD4RGB	46	119	33	3927		1st W4

Operators:
UZ1Z: UT0ZZ, UX0Z
KP2D: KP2N, NP2E, NP2W, NP2DJ, KP2CM
S50U: S54E, S50U
AN1BD: EA1BD, EA1ALD
OM2OOO: ?
UF3CWR: RV3BR, RZ3AZ
YU7AL: YU7AL, YZ7EM, 4N7RGH
RK9CZO: RX9CAZ, RA9CDH, RA9CDF, RV9CDW, Konstantin & Igor
W0DC: W0LSD, W0BV, W0DC
KE7AJ: KE7AJ, K7OX
KJ7TH: KJ7TH, W7II, KD7AKN, KW7N
3Z1V: SP1MHV, SP1-305-KO
AE9D: AE9D, Nick
SP1PLA: SQ1FTB, SP1-22-014
UZ7Z: UR5ZLY, UT4ZO
OZ7HVI: OZ1CJX, OZ1AA
W3DSX: KE3E, W3GJS, W3DSX
KD4RGB: KD4RGB, N4VHK
T91EZC: T94KM, T95NAS, T95NEN, T95NER, T95NES, T95NUR
N3IXR: N3IXR, WA3SES
YB3ZES: YD3BMB, YD3TYO, YD3TWZ
VE3FJB: VE3FJB, VE3DDG, VE3IJM, VE3ABG, VA3CW, VE3THR, VE3VSM
IK7XIV: IK7XIV, IK7YUA

Single Operator, All Bands, High Power

Callsign	Q's	Pts.	WPX	Score	Record	Reward
CT3BX	1268	4994	445	2222330	WR+AF	Plaque (World)
EM0I	1458	4055	464	1881520	EU	Plaque (EU)
Op: UT2IZ						
HK3WGQ	1216	4143	443	1835349	SA	Plaque (SA)
LU6ETB	1187	3420	454	1552680		1st Argentina
FM5CD	1215	3336	448	1345075		Plaque (NA)
IZ2AVK	1164	3459	430	1338633		1st Italy
OM3RM	1105	3191	440	1263636		1st Slovakia
IK1GPG	1103	3072	452	1249690		
JH4UYB	1065	3262	417	1224254	JA	Plq JA/1st JA4
DK0EE	1066	3246	412	1203617		1st Germany
Op: DL4MDO						
K4GMH	1058	2787	408	1137096		Plq US/1st W4
YU7YG	1030	2879	388	1117052		1st Yugoslavia
8S4RY	993	2851	381	1086231		1st Sweden
Op: SM4GRD						
K5YG	1145	2512	420	1042480		1st W5
HA3LI	890	2758	365	1006670		1st Hungary
WW7OR	1162	2413	405	977265		1st W7
RX9SR	803	2708	323	874684	AS	Plaque (AS)
NO2T	895	2336	368	856733		1st W2
OG6XY	838	2574	368	852508		1st Finland
RM4W	1075	2490	378	847098		1st EU Russia
K3NC	871	2245	357	801456		1st W3
DL7VOG	796	2445	360	792180		
LY3BH	859	2356	367	778186		1st Lithuania
JH6ETS	722	2259	343	774837		1st JA6
OH2GI	829	2372	350	749315		
OH2LU	788	2218	336	745248		
GW4KHQ	761	2042	350	714700		1st Wales
S56A	760	2216	358	713995		1st Slovenia
EA3RH	924	2184	363	713513		1st Spain
N2WK	782	2001	349	698349		
VK4UC	618	2024	305	617320	OC	Plq OC/1st VK4
NE3H	690	1858	331	614998		
RA3ANI	734	2036	301	612836		
JA1BWA	659	1929	314	605706		1st JA1
W1RY	752	1903	339	580605		1st W1
W8JGU	659	1707	324	553068		1st W8
SM6WQB	621	1796	289	519044		
KE6YTT	917	1601	303	485103		1st W6
N5JR	623	1402	325	455650		
N6HC	782	1553	289	448817		
UV5U	532	1563	271	423573		
Op: UX1UA						
RK6BZ	600	1679	248	416392		
N2FF	570	1406	295	414552		
ZL6QH	469	1596	255	406980		1st NZ
Op: ZL2AMI						
OK2WO	510	1433	280	401240		1st Czech Rep.
NN6XX	656	1296	309	400464		
RZ1AZ	555	1416	276	394128		
W9OL	620	1322	296	391312		1st W9
LA7CL	517	1435	264	378840		1st Norway
W5ER	641	1354	276	373704		
SV/OK1YM	490	1413	251	354663		1st Greece
W8KX	514	1241	285	353685		

KB3TS	511	1277	276	352452	
EU1MM	476	1352	256	346112	1st Belarus
UA0AGI	464	1502	229	343958	
RU3AT	495	1322	257	339754	
VE5CPU	519	1319	245	323155	Plq VE/1st VE5
AA7A	579	1197	264	316008	
UA4LY	528	1194	256	305664	
IK1HSR	400	1297	219	284043	
UA4RC	500	1172	237	277764	
EU1SA	400	1210	218	263780	
K5AM	539	1027	238	244426	
VE7BTO	422	1118	234	239252	1st VE7
W0YR	417	953	249	237297	1st W0
EA2BWM	383	983	225	220950	
SI5SSA	361	1018	207	210726	
Op: SM5EIT					
AJ3M	443	881	237	208797	
OG3RM	359	862	231	183084	
YB0UNC	300	101	179	179179	1st Indonesia
VE7QO	349	923	194	179062	
VK6GOM	283	856	176	150656	1st VK6
NA2M	321	775	193	149575	
N6EE	353	694	206	142964	
DL6JZ	282	787	174	136938	
OK2BJT	305	736	186	136896	
WA6BOB	427	808	169	136552	
CG3RZ	300	826	164	135464	1st VE3
WA8RPK	307	651	190	123690	
W6KNB	368	700	174	121800	
W2JGR/0	350	688	172	118336	
DU3NXE	268	808	139	112312	1st Phillipines
WB6BIG	274	593	174	103182	
NX4W	287	536	177	94872	
DK6CQ	214	612	151	92412	
W7DPW	301	591	148	87468	
DJ2IA	240	520	166	86320	
OH7MA	205	547	154	84238	
K3WW	204	575	144	82800	
AA9RR	256	521	155	80755	
K1JE	199	530	143	75790	
W40X	190	445	135	60075	
N7GC	230	458	127	58166	
KH0/JJ2NYT	203	429	128	54912	1st Saipan
XE1V	165	436	106	46216	1st Mexico
IK2REA	145	372	111	41292	
K6RIM	165	345	111	38295	
IK4WMH	140	330	113	37290	
OE9SLH	92	320	85	27200	1st Austria
WE9V	133	251	105	26355	
W0PRJ	135	256	96	24576	
N7VGO	109	249	82	20418	
AN1AAA	107	219	93	20367	
Op: EA1AAA					
PA0WRS	53	167	47	7849	1st Netherlands
W5KQJ	69	122	55	6710	
W6JOX	55	123	40	4920	
OG7WW	41	153	31	4743	
UA9XEN	44	109	39	4251	
K5ZD	35	125	31	3875	
N3NZ	54	86	45	3870	
HL1XP	14	38	11	418	1st Korea

Single Operator, All Bands, Low Power

Callsign	Q's	Pts.	WPX	Score	Record	Reward
UP5P	1246	4170	439	1830630	WR/AS	Plaque (World)
Op: UN5PR						
ZX2B	1066	3172	410	1300520	SA	Plaque (SA)
Op: PY2MNL						
HA2A	1082	3218	392	1261456	EU	Plaque (EU)
PW2A	982	2877	414	1191078		
Op: PT2BW						
AA5AU	1212	2539	418	1061302	USA	Plq NA/1st W5
LT0H	915	2864	399	1028462		1st Argentina
Op: LU3HY						
VP2V/W8JAY	891	2590	364	942760		1st BVI
4Z5CP	836	2672	322	860384		Plaque (AS)
EA1CRB	850	2391	348	832068		1st Spain
EU1DX	801	2251	369	830619		1st Belarus
3Z9U	814	2290	351	803790		1st Poland
Op: SP9UNX						
YU7AM	760	2238	337	754206		1st Yugoslavia
DA2OOO	773	2268	330	748440		1st Germany
Op: DL4RCK						
OK2WY	732	2136	335	708404		1st Czech Rep.
EA8/DJ1OJ	698	2123	345	659191	AF	Plaque (AF)
S57U	727	2044	338	621784		1st Slovenia
DK3WW	683	1966	329	582133		
F6AUS	663	1848	348	578794		1st France
RA1ACJ	690	1707	326	556482		1st EU Russia
9A6D	610	1855	292	541660		1st Croatia
RX9JM	666	2069	288	536284		1st AS Russia
N6OJ	904	1645	319	524755		Plq USA/1st W6
OH3NGB	673	1903	275	523325		1st Finland
KI0LO	791	1671	312	521352		1st W0
RS0F	628	1740	299	520260		
Op: UA0FZ						
MM0BYC	688	1810	287	519470		1st Scotland
EI4DW	653	1840	311	515016		1st Ireland
KQ4/KL7Q	741	1647	309	508923		1st W4
F5JKK	593	1622	309	501198		
UA6AN	606	1792	273	489216		
UR5MID	593	1539	312	480168		1st Ukraine
YV5AAX	562	1836	290	479196		1st Venezuela
IK6SNQ	562	1585	302	478670		1st Italy
KE1AK	730	1629	289	470781		1st W1
SN8A	618	1730	265	458450		
WB8YJF		1626	280	455280		1st W8
KI6DY/0	789	1598	283	452234		
DJ3NG	573	1590	284	451560		
CO8LY	614	1616	273	441168		1st Cuba
GM3UTQ	606	1489	288	428832		
SM7BHM	544	1560	274	427440		1st Sweden
OK2VWB	506	1500	278	417000		
EA3TB	598	1427	319	409691		
HA4YF	500	1434	268	384312		
ES1RF	538	1516	253	383548		1st Estonia
W4LC	565	1325	287	380275		
UA9OGC	489	1568	236	370048		
SM6SRW	516	1537	237	364269		
WB2EUF	508	1479	236	349044		1st W2
8P6SH	464	1361	256	348416		1st Barbados
K8RS	526	1282	271	347422		
ZS6RVG	445	1325	262	347150		1st S. Africa
CG6RAJ	570	1481	233	345073	Plq VE/1st VE6
9A6ACY	432	1465	232	339880	
EA5BS	506	1278	252	334836	
IV3KAS	480	1405	238	334390	
WA1EHK	505	1261	265	334165	
UA3SAQ	505	1340	245	328300	
SM5UFB	462	1348	238	320824	
G0PCA	494	1382	229	316478	1st England
DL1ARJ	437	1265	250	316250	
KE4KWE	587	1267	249	315483	
F5NZO	422	1080	288	311040	
N6IJ	587	1151	268	308468	
I2SVA	446	1256	240	301440	
RA3LBW	436	1299	231	300069	
JA2BY	413	1218	235	286230	1st JA2
Z38A	493	1249	229	286021	1st Macedonia
EA8AKQ	411	1269	223	282987	
SP5ALV	400	1158	240	277920	
JL6HKJ	418	1145	238	272510	1st JA6
N8YYS	436	1118	243	271674	
RA6AZ	505	1054	255	268770	
DL2AL	419	1156	230	265880	
RA4CTR	502	1099	235	258265	
SM6BSK	408	1148	221	253708	
UA4LU	434	1089	230	250470	
DM5GI	400	1200	203	243600	
VE6CKG	448	1154	209	241186	
DK3GI	365	1081	222	239982	
RA1AW	406	945	248	234360	
JK1IQK	375	1059	219	231921	1st JA1
OK1HFP	400	1163	199	231437	
DL3AYJ	360	1078	210	226380	
G3YJQ	378	1007	220	221540	
EA2BWM	383	982	225	220950	
SP9LKS	366	1031	207	213417	
DL1LSZ	346	935	228	213180	
IK1NEM	360	984	205	201720	
IT9JOF	335	859	225	193275	
SP8FHJ	346	1064	180	191520	
RA0JJ	396	941	198	186318	
WA9ALS	373	871	210	182910	1st W9
AC5SU	384	913	196	178948	
K1SD	329	869	204	177276	
IK1DFH	329	912	193	176016	
OK1JN	306	935	185	172975	
OH4BB	340	841	202	169882	
HB2AWS	311	962	172	165464	1st Switzerland
HB9HQX	319	965	169	163085	
IK0PHW	325	787	207	162909	
ES1BH	325	937	171	160227	
OZ1CQX	304	832	191	158912	1st Denmark
I4HRH	301	888	178	158064	
GU0SUP	300	696	227	157992	1st Guernsey
OK2VP	293	845	180	152100	
JJ3VPY	295	804	189	151956	1st JA3
ON4AME	268	893	169	150917	1st Belgium
7S60F	325	729	206	150174	
Op: SMAAY					
UA9AX	270	930	161	149730	
VE9WH	341	748	199	148852	1st VE9
K8VT	375	811	177	143547	
UT4HZ	303	822	173	142206	
SM5LNS	299	806	171	137826	
RV6BO	305	801	168	134568	
DK7FP	253	795	169	134355	
ES4BG	275	790	166	131140	
AD7U	338	759	172	130548	1st W7
JH3CUL	265	780	167	130260	
LX1JH	395	639	199	127161	1st Luxembourg
WT6P	382	692	182	125944	
ON4BG	257	770	161	123970	
KC4SAW	311	700	177	123900	
SM3ETC	280	704	172	121099	
OK2PDM	243	605	196	118580	
G0URR	248	709	166	117694	
DF1ZN	256	683	172	117476	
IZ1AVA	265	729	160	116640	
YO3APJ	252	640	181	115840	1st Romania
SP4MPH	257	712	162	115344	
DL8SDC	261	636	181	115116	
UN9FD	253	718	160	114880	
OZ9AG	258	672	169	113568	
VE3BUC	254	683	161	109963	1st VE3
RA9XF	226	741	148	109668	
ON4KGL	260	631	172	108532	
OZ5MJ	241	671	159	106689	
LZ2MP	244	679	157	106603	
DL8NFU	239	628	165	103620	
RA3BB	234	644	157	101108	
OK2BMC	250	698	144	100512	
DJ2YE	237	701	143	100243	
VE1AOE	248	591	167	98697	1st VE1
DK8EY	224	645	151	97395	
W6ISO	312	579	168	97272	
IZ4BKI	232	601	160	96160	
UT4EO	227	635	149	94615	
II0CV	252	499	188	93812	
SL4ZAE	242	677	138	93426	
OE1KTS	231	588	158	92904	1st Austria
EA2BNU	287	527	176	92752	
SP4BOS	222	659	139	91601	
SM7ATL	211	686	136	90848	
SP3XR	210	633	140	88620	
EA3GIP	192	684	129	88236	
IO0KHP	196	615	142	87330	
JR1KSK	239	653	133	86849	
W3MEL	277	550	157	86350	1st W3
AD6G	305	583	148	86284	
W4JLS	247	580	148	85840	
EA6SK	219	517	150	85650	1st Balearic Is.
KA2D	214	578	144	83232	
OK1AKB	202	593	140	83020	
SM4LLN	222	584	142	82928	
EA4BQG	201	463	179	82877	
DF3IS	215	527	157	82739	
IV3HAX	231	525	157	82425	
IK2WYI	191	464	177	82128	
YL2LW	229	610	133	81130	1st Latvia
HB2DBK	213	548	146	80008	
IK8SCR	199	570	137	78090	
W9ILY	225	522	147	76734	
JH8KYU/1	202	561	136	76296	
LA5YW	197	549	138	75762	1st Norway
W0RRY	249	505	150	75750	
SP7DQR	177	525	144	75600	
N0IBT	260	495	150	74250	
KF6BIR	278	521	141	73461	
EW1EA	210	543	133	72219	
JA2MNB	176	512	140	71680	
GW0ANA	206	515	138	71070	1st Wales
SM7BGE	225	492	144	70848	
S57XX	200	491	143	70213	
F8BQQ	182	508	134	68072	
UT5UML	201	470	144	67680	
YL2NS	196	473	135	63855	
K8OSF	212	440	144	63360	
N3SL	217	421	144	60624	
K9BJM	212	453	132	59796	
W8DN	193	455	130	59150	
UU9JQ/QRP	148	573	103	59019	
JA1BUI	177	465	125	58125	
LA5QIA	202	469	123	57687	
OG1MM	171	503	114	57342	
9V1XE	195	488	117	57096	1st Singapore
K3GH	207	462	120	55440	
DL6UAA	146	535	101	54035	
RW0BG	164	423	127	53721	
K7ZO	208	455	118	53690	
VA3SB	173	459	116	53244	
DL6NDN	160	451	118	53218	
DL7VBO	151	458	110	50380	
JA3MIB	157	430	114	49020	
PA7RCE	165	414	114	47196	
IK7RVY	149	329	141	46389	
OK2KV	156	429	108	46332	
JR3RIY	154	411	112	46032	
UA6ACK	170	409	109	44581	
N9CK	158	352	126	44352	
DL5IAM	153	369	116	42804	
N6TQS	182	369	113	41697	
IK2WFN	145	372	110	40920	
HL2AMO	138	385	106	40810	1st Korea
SP2EIW	137	353	114	40242	
WA9AFM/5	201	388	99	38412	
PS7ZZ	128	372	102	37944	
N5RXF	214	307	123	37761	
XE2XX	157	381	98	37338	1st Mexico
EA2AVM	128	378	98	37044	
DL1EJD	137	333	105	34965	
WB9VGO	150	338	100	33800	
ON7YP	127	349	95	33155	
VE6RRD	161	358	92	32936	
DH9FAJ	133	344	94	32336	
VO1HP	118	338	95	32110	
W1EZ	131	333	94	31302	
RN2FA	152	290	107	31030	
DL4SDT	129	317	94	29798	
SP3JHR	216	613	47	28811	
RA6ABW	137	273	102	27846	
DL9YP	126	292	95	27740	
IS0YTA	114	259	107	27713	1st Sardinia
YO3FRI	144	232	113	26216	
KE6QR	132	277	94	26038	
KI0F	126	290	89	25810	
K8CV	120	270	93	25650	
JA0AXA	109	301	84	25284	1st JA0
LZ2AU	111	257	91	23387	1st Bulgaria
RA4AFZ	121	253	92	23276	
N2UM	115	244	95	23180	
CG3RHJ	114	275	84	23100	
JH5OXF	98	280	80	22400	1st JA5
SP2JLR	94	257	87	22359	
UA9JMS	100	276	81	22356	
SP2JPG	98	264	83	21912	
IV3KSE	98	291	74	21534	
HL3AHQ	102	281	75	21075	
HS0GBI	103	276	76	20976	1st Thailand
N4CU	116	226	89	20114	
AF8C	122	235	85	19975	
KO2FB	127	252	78	19656	
DL3ARK	103	245	79	19355	
SP2GWZ	138	311	62	19282	
LA9QL	154	423	44	18612	
WB9BSH	90	206	87	17922	
I1JNZ	100	229	78	17862	
M0CFV	89	221	76	16796	
KF6RY	119	200	81	16200	
AA4RP	99	207	76	16146	
K2CY	104	220	73	16060	
WP4LNY	74	225	68	15300	1st Puerto Rico
N4CW	110	182	82	14924	
SP2EWQ	64	202	56	11312	
UT1UA	70	176	59	10384	
SP3CUG	102	287	36	10332	
W3AG	64	186	54	10044	
W8IDM	72	167	60	10020	
W7GTO	72	158	58	9164	
N2ALE/6	87	151	58	8758	
W3FQE	62	134	52	6968	
CX9AU	52	143	48	6864	1st Uruguay
WB7QBO	74	121	56	6776	
IK0MIB	53	135	50	6750	
IK2EBP	51	125	51	6375	
KA9NZI	60	114	51	5814	
VE9DX	50	111	45	4995	
PA0EHF	44	131	37	4847	1st Netherlands
SP7GAQ	24	81	27	2187	
K2YG	35	77	28	2156	
JK2VOC	32	79	24	1896	
EA7AAW	25	50	23	1150	
NN2T	26	50	23	1150	

SWL

Call	Pts.	Reward
ONL383	1050174	1st Belgium
DE0WAF	52250	1st Germany
I7-1237BA	12586	1st Italy
OH3-911	7350	1st Finland
OH1-688	65	

Check Logs Received From DL5JWL, EA4AZJ, EA5DWS, EA5GMA, EA7CP, G3EMT, HK3DDD, K3SWZ, LU6AM, LU6DAT, OH2BHD, OH2OM, RM4W, RV9BB, SN8M, SP2BIK, SP4HHI, SP7ICE, SV1AHV, UA0CA, UA1OMS, UA9XK, UP6F, UT7I, UX1IL, VE4COZ, WA2EYA, WS7I. Results prepared by Eddie Schneider, W6/G0AZT (CQ/RJ RTTY WPX contest manager).

1999 CQ/RJ World-Wide RTTY DX Contest Results

Ron Stailey, K5DJ

Callsign	Score
Single Operator, 3.5 MHz	
UT9F	61,488
S75CQ	59,284
9A9A	57,040
9A5Y (Op: 9A6KTS)	46,648
CT1AOZ	36,814
LY1BZB (Op: LY2BKF)	32,302
S54A	20,805
UT2II	19,398
W8EB	10,075
KE9NA	2,814
Single Operator, 7 MHz	
S57AW	245,055
EA8PP	218,004
W0ETC	59,236
OK2EQ	47,802
K3KO	20,748
YU1BO	15,686
F/OK1EE	13,200
HD3W	5,106
Single Operator, 14 MHz	
9A2DQ	404,448
VA3MM	382,184
UA4LCQ	364,620
G5G (Op: G0NUP/G0LII)	352,365
5B4WN	279,660
LZ7Y	278,025
SP4CHY	240,320
OM5XX	213,204
UT9NA	206,190
4X6UO	188,238
SN7N	159,132
UX6F	156,845
IT9GKQ	110,250
I8UZA	104,520
RW0BG	58,636
7K4QOK	41,420
W2YR	37,050
EA7AIG	34,749
ON4VV	28,440
SP2GNB	21,420
K7NO	18,640
YL3FW	18,288
DL9MBZ	17,820
RA4LM	15,576
WA4TQS	7,380
N3ZA	5,640
JA2KPV	1,638
LU6DAT	1,128
Single Operator, 21 MHz	
8P9Z (Op: K4FJ)	597,987
9A5W	470,057
ER0F (Op: UX0FF)	454,660
NP2E	402,862
AE0Q	365,427
S57IIO	346,248
RK6AXS (Op: UA6AJU)	313,071
EA9JZ	300,736
EA7FTR	296,244
ZW2A	293,678
HJ3PXA	282,720
ND5S/8	258,850
K7WM	255,142
JE2UFF	244,112
EW2CR	210,380
UA9CLB	209,751
LU8HWD	182,642
K4WW	159,331
LZ2UF	157,768
WB3D	147,862
YU7NW	142,000
AG4W	137,959
G0MTN	132,745
YO3JF	125,268
W4LC	122,976
LZ1DFP	121,131
JA2BY	118,809
JA3EVZ	115,240
I2ZZZ	96,678
VE6JY	94,975
W3RTY	82,280
N7GC	81,708
T94MZ (Op: T93Y)	76,266
JG1GGU	70,596
EC2ADR	65,124
SV1CIB	61,692
OK1BMW	60,990
UT0H	46,761
9K/KK5OQ	40,128
YY4GMB	39,500
DL1LH	38,218
N8PR	34,848
LZ1CF	34,760
SP8AQA	33,896
RX3ABN	27,886
SQ4CUM	21,045
UA3DJY	16,932
DK3WW	16,206
JR3RIY	14,756
DL1EMH	12,789
JF5FGY	8,533
LU6DAT	7,840
LU9APM	7,590
SM7BUN	5,712
SQ4GXO	2,040
Single Operator, 28 MHz	
PY2KC	369,562
LU3EKC	342,103
HC1JQ	307,365
LT3C	300,339
LW7EIC	281,281
HK3TAS	275,054
PJ2MI	226,774
S50U	209,250
ZP6CC	195,456
YU7YG	86,140
UA0CA	49,895
JA1SJV	34,188
JE2OTM	33,840
JA8RJE	33,300
SP2RBT	25,284
EA7BJV	21,248
OH2BP	20,084
GW0ANA	16,185
N1MGO	12,824
RU3WR	6,985
OK1DCP	5,412
HA0GK	5,332
UA6LP	5,085
Multi-Operator, High Power	
VY2SS	3,693,690
OT9E	3,500,656
IK2QEI	3,475,276
OH1F	3,259,872
YL4U	3,247,692
RY9C	3,135,000
RU1A	3,107,025
OM5M	2,871,596
KH7R	2,826,516
DJ7AA	2,757,504
PI4COM	2,511,960
IK2BUF	1,999,107
DL0GK	1,942,925
OL5Q	1,884,948
JH4UYB	1,788,720
AF4Z	1,785,295
CE8SFG	1,731,465
OH0XY	1,627,881
LZ2K	1,330,830
RK9JWZ	828,184
UP6F	727,832
RK3RWL	629,000
N0MJ	489,240
VE3FJB	447,630
LZ2MC	99,594
SN1I	23,552
LW8EXF	3,608

Operators:
VY2SS: VY2SS, K5DJ, WT4I, W4GKM, N1RCT, VY2LI, VE9DX, VE9MY, VE9WH, VE5FN, VY2DR
OT9E: ON4GG, ON4AME, ON4CBA, ON4ANT, ON4AOI, ON4AWK, ON4AMM
IK2QEI: IK2QUE, I2EOW, IK2PZC, IZ2AAJ, IK4MTF
OH1F: OH1MDR, OH1MM, OH1NOA
RY9C: UA9CGA, RW9CF, RV9COX
RU1A: RW1AC, RN1AM, UA169-946, Alex Vadim
OM5M: OM1KM, OM2KM, OM2RA, OM3BH, OM3BG
KH7R: KH6ND, KH7U, AH6OZ
PI4COM: PA3BWD, PA3EWP, PA3EA, PA5ET, PA7FM
IK2BUF: IK2UCK, IT2AVK
OL5Q: OK1HRA, OK1VSL, IK1INC, OK1FFU
AF4Z: KC4HW, KE4MMI, WA4HDS, WB2EQS, K4QD, K4AW, K4PX, AB4ET, KT4FY, KF4ZNC, K9ES, NB4C
CE8SFG: CE8FSG, CE8FGC, CE8GLQ
OH0XY: OH1DT, OH3TY, OH3WK, OH6XY
RK9JWZ: UA9JIJ, UA9JMD, UA9JMS
RK3RWL: RN3RC, RN3RX
N0MJ: W0GJ
VE3FJB: VE3IJM, VE3VSM
LZ2MC: LZ1MYL
LW8EXF: LU7DW

Multi-Operator, Low Power	
Z30M	2,226,536
KE1FO	1,980,508
9A5D	1,353,828
S57KM	1,283,732
RK9CZO	806,400
9A7P	761,530
KD4RGB	457,412
N6OJ	386,451
F5TEU	320,073
WB8SKP	275,094
WN1E	225,153
F5KQN	206,800
K9OSH	66,519
UR4EYN	49,035
UU9JWL	4,628
Operators:	
Z30M: Z31GX, Z32PT, Z32XX, Z31JA, Z33ZOD	
KE1FO: KT1M, WM1K, N1XS, KE1AK, W0DC, K1TTT	
9A5D: 9A3AY, 9A4NC	
RK9CZO: RK9CAZ, RX9CX, RA9CDH, Rjamov K.	
9A7P: 9A5AEI, 9A6NHH, 9A3RE, 9A6NPM	
KD4RGB: KD4RGB, N4VHK	
N6OJ: K6ZWB, K6ANP, K6WAP	
WB8SKP: KA8CVE, WD8OWA, NK8G	
WN1E: WN1E, AA1MM	
Multi-Operator, Multi-Transmitter	
HC8N	11,081,800
P3A	7,571,382
W3LPL	6,280,423
RW2F	5,610,781
HG3DX	5,584,727
RM6A	4,432,319
RK0AXX	3,170,034
LU4FM	2,404,364
N9NCX	2,167,308
UA6AN	1,974,780
KI6DY	1,457,646
VE7SOD	1,421,928
K8AA	772,551
Operators:	
HC8N: N4GN, WF1B, W6OTC, K6AW, HC1OT, W5AP, N5KO	
P3A: RA9JX, RZ3TZ, UA9CDV, RA0AM, RZ9WZ, UA9CKP	
W3LPL: K4GKM, N3OC, N3UN, N8YYS, NE3H, NO2T, W2GG, W3EKT, K3MM	
RW2F: RA2FA, RN2FA, UA2FB, UA2FF, UA2FZ	
HG3DX: HA1TL, HA1DAC, HA3UU, HA3AU, HA3UF, HA9RU, HA9OA, HA9RC, HA1YA, HA1WD	
N9NCX: KS9W, KG9X	
UA6AN: UA6AF, UA6AHF, RA6BE, RA6ABW	
VE7SOD: VE7CFD, VE7SZ, VA7RR	
K8AA: K8AA, KG8CO	
Single Operator Assisted	
UX0B	3,567,116
W2UP	3,147,300
KI1G	2,691,084
JS3CTQ	2,054,289
DK3GI	1,721,055
HG5C (Op: HA5LV)	1,616,145
DK0EE (Op: DL4MDO)	1,580,878
DF3CB	1,512,738
UA9MA	1,458,984
HA2A	1,326,117
S56A	1,304,885
N2FF	1,144,638
LY3MR (Op: LY2BIL)	1,076,475
AE9D	928,984
K3WW	796,090
IK2RZP	774,566
WF5T	771,173
UP0F (Op: UN7FK)	750,778
W4PK	658,376
AD1C	599,090
FM5CD	505,177
N3NT	458,280
VK6GOM	451,800
K1SM	343,870
EA5RM	256,115
AA9RR	252,495
LU6FAZ	236,328
K0BX	212,544
F6IFY	194,357
DL8NFU	141,219
KQ4QM	132,795
KB6BIR	85,428
IK4WMH	60,915
OH2LU	42,741
W3AG	35,640
KK0DX	21,756
7M4KSC	11,627
3Z0MDL	9,945
Single Operator, High Power	
P43P	3,633,216
EM0I	3,553,022
TY1RY (Op: G0AZT)	2,992,411
UP5P (Op: UN5PR)	2,595,159
S58T	2,335,440
LZ5Z	2,127,684
IK1GPG	1,974,558
RX3DCX	1,810,620
N8NR (Op: N9AG)	1,660,176
HK3WGQ	1,548,498
DL5AXX	1,540,250
W1ZT	1,468,274
4U1VIC	1,458,801
HZ1AB (Op: K8PYD)	1,455,654
S53MJ	1,381,252
9M6BG (Op: VR6BG)	1,350,741
I1COB	1,330,000
EU1MM	1,278,700
HA3LI	1,263,354
RX9SR	1,259,072
VA7CC	1,214,274
WW7OR (Op: W7GG)	1,200,001
YU7AM	1,177,848
HA8BE	1,137,325
DL4MCF	1,103,801
DJ6QT	1,089,468
DL7VOG	1,076,976
JA1YNE	1,056,482
WE9V	1,000,935
UA4LU	956,120
GW4KHQ	892,430
VA3DX	873,136
JA1BWA	829,560
SM5FUG	825,430
AH8LG	778,344
W4OX	770,655
4U1ITU (Op: OM1AM)	753,129
AA7A	726,235
YB5QZ	715,302
OK2BXW	715,041
VE6SV	708,180
CE8WBJ	685,783
EA2ASB	644,250
5B4AGE	641,862
KJ7TH	588,587
OM3IAG	559,554
EU1TT	548,298
K5ZD	545,748
KC7V	545,741
ZL2AMI	527,400
PA3DHR	507,036
LA7CL	501,296
WB8RPK	485,760
VE5SF	471,408
N4IQ	470,871
ES7FQ	430,976
W0HW	409,565
N2KI	404,248
EL2WW (Op: ON4WW)	378,144
WB0BBY	373,516
RZ1ZA	370,413
F6IRA	369,622
DL4RCK	365,310
W2JGR	363,538
YB0UNC	345,675
VE7BTO	326,570
NA2M	325,920
8S4BX (Op: SM4GVR)	318,937
WB8YTZ (Op: KF8UN)	314,648
RU3AT	287,076
WA8AA	286,554
K1JE	283,392
KG6OK	279,720
KC8BI	278,778
DL7IO	273,153
W6KNB	256,940
K6HGF	242,403
N5RXF	237,490
W6IWO	227,052
OH2GI	225,515
OK2BJT	213,300
WA0SXV	211,864
DM3HZN	211,820
W7RSJ	201,305
OK1DWC	196,137
NT4D	195,337
W7PPW	195,170
IK2FVO	194,967
W8KEN	193,004
OZ6EI	189,823
W6ISO	168,948
CT1FRN	168,036
JH3AIU	165,312
JA2AXB	163,401
SP3CUG	137,532
W3FM	134,136
K7EX	133,104
NA4M	131,738
OE8CIQ	124,307
W8OSE	119,439
KA0WBP	116,480
4F3XX	113,904
JJ1VEZ	108,720
F3PZ	97,908
UA4LY	90,168
S59L	87,969
W2HCA	76,912
VE5CPU	73,525
YS1RR	69,745
UA4CJJ	60,750
EA2AKP	53,648
HL9ZB (Op: KE9XB)	50,700
VE3WQ	24,206
RK6CZ	15,925
OH2NS	15,548
T31T (Op: SM0AGD)	14,300
SM5EIT	11,500
K0COP	7,316
Single Operator, Low Power	
AA5AU	1,716,112
VP5JM	1,601,328
PY2MNL	1,419,990
VO2WL	1,178,310
UY8IF	1,149,615
LV5V (Op: LU5VV)	1,148,868
WB8YJF	1,114,282
EA1CRB	1,097,911
JY9NX (Op: JM1CAX)	1,087,019
UA0FZ	1,028,432
EU1DX	990,486
RA1ACJ	923,184
S57KM	909,376
F6AUS	837,675
W4/KL7Q	820,356
HA5BSW	818,399
4Z5CP	816,320
K1SD	805,800
OK2VWB	781,122
VE4COZ	766,112
FK8GM	759,066
VE3GLN	732,487
EA1MV	716,906
W8PT	705,120
N3SL	697,694
WA1EHK	654,170
CO8LY	650,360
DK3VN	649,948
EA1BD	642,756
8P6AH	641,820
SP2EWQ	637,650
MM0BYC	637,200
DJ3NG	583,219
GM3UTQ	574,692
VE2AXO	573,344
W1VXV/VE2	567,440
EW1EA	546,757
OK2WY	531,031
YO3APJ	518,504
EI4DW	506,196
OK2PMS	467,712
SV9/DJ9XB	461,376
OH3NGB	458,134
HA4YF	455,752
VK2KM	453,375
KR6E	450,138
RA9MY	449,568
KJ5SF	441,134
IK4ZIF	432,630
SN6WQB	431,162
PA3EMH	427,614
YU7AE	413,368
N6GG	404,625
N6HC	404,404
9M2TO (Op: JA0DMV)	401,580
UA3SAQ	400,465
SV1DU	384,902
SM6BSK	372,570
EA5BS	356,277
N5XUS	346,380
PA3HCF	338,826
ZS6RVG	324,095
RA1AW	318,866
N1WAT	290,850
IK1DFH	289,172
9A3CY	288,765
VE7IRA	280,298
PY1KS	275,058
GU0SUP	274,256
K2YG	273,465
SP9LKS	269,724
WB2WPM	268,550
OK2PCL	267,264
DL5NA	264,702
SP6DNZ	258,382
DL2FAG	258,156
VE6CKG	250,425
IK1VLL	250,371
KR4U	246,810
DM3ML	234,896
SM6SRW	232,023
W9ILY	231,840
DF3IS	219,904
K9JY	217,932
F5PVJ	214,711
DL5ZB	212,910
I4HRH	212,482
VE3BUC	212,009
S57U	206,440
LX1TO	202,681
AC5SU	201,780
K5NZ	201,628
HB9DOD	200,600
VE3IAY	191,860
EA8AG	187,968
SP4MPH	184,005
AA1SU	180,564
EU1SA	178,104
AA5VN	177,505
KE4PPI	174,717
OE1KTS	173,019
DJ2YE	171,350
DL6BE	164,651
UT2UZ	164,220
WA3KPP	163,312
YV6DBX	162,279
WZ1Q	161,880
HA3VAM	156,769
EA8AKQ	153,276
SP7DQR	150,870
SM6FUD	147,275
IK1ZFO	145,266
LU6AM	143,349

UA4RZ	141,610
JH8KYU/1	140,844
SP6CXH	140,094
SM5UFB	135,917
WA6BOB	133,920
K1KU	133,248
DL8SDC	133,131
OZ5MJ	132,756
DL4TL	127,050
K7RFM/VE6	125,618
ON4BG	125,256
SM4LLN	125,105
DJ3OE	123,615
JA7EMH	122,144
SI9AM (Op: SM3DXC)	121,910
HB9HQX	121,362
UN9FD	121,183
W3GG	120,406
SP8FHJ	119,848
VE1AOE	116,083
PA0EHF	115,464
IK8SCR	112,312
LZ2MP	111,320
SP3XR	110,760
N6TQS	108,500
K8MM	104,832
K4FPF	101,600
W5DG	101,520
ZL2JON	100,016
F5OKD	100,005
DL1EJD	99,960
UT5UML	99,820
N7UVH	98,195
OK2LC	97,175
AD7U	96,924
W4ZGR/1	92,781
N0IBT	91,868
AD6EN	90,480
W6CN	90,423
EA7BDL	88,433
ON7YP	87,657
W0BCF	87,318
LA5TFA	86,376
SP2IU	86,040
JA7KM	85,636
K7ZO	83,126
K5OH	81,404
N3YEA	80,496

OK2VP	79,285
LZ2NB	75,834
OE/DL8NBE	73,617
LX1JH	72,960
SL4ZAE	72,885
DL5IAM	72,192
IK2WYI	71,906
W6IHG	71,424
KZ5E	70,688
DL1LSZ	70,227
PA3HGL	66,582
WA6NOL	59,096
DU67SAN	57,996
IK2VVR	57,772
9V1XE	57,462
RA3UAG	57,460
PA3AQL	56,880
SP7A	56,021
VE2JR	54,016
KG8XP	53,430
SP3JHR	51,968
KC6G	51,625
KF4KSN	49,362
PR7AR	48,068
KC9UU	45,724
KK4E	45,144
SP8NFF	43,307
IK2NCF	41,856
PA0MPN	41,358
Z31JA	40,500
LY2FN	38,190
YL2NS	37,875
WR1V	37,536
JA3MIB	36,400
DN1JC	35,400
VE2FFE	34,122
DH7DJ	32,495
JA1BUI	32,385
F5DXN	31,635
ON4CAS	30,875
YV5AAX	30,492
W8IDM	30,208
I0ZUT	28,674
HA4YS	27,830
DK4IO	27,084
KF4OAD	24,955
IV3KSE	24,150
ES7AB	23,736

W9ISC	21,583
IK2WFN	21,311
LZ5AZ	18,980
RA4AFZ	17,690
IV3KAS	16,200
EA3AQL	15,444
IK4YNR	14,280
M0AEJ	14,070
OH5HCK	12,771
LA9PJA	12,628
JH1QDB	12,555
W7WHY	12,354
AJ4F	12,267
W7GTO	11,025
UA9CDC	10,010
JK2VOC	8,662
K7MK	8,428
SP6HQT	7,395
DL7VXX	6,660
JN1MSO	6,477
AC6JT	6,348
AB7NV	6,030
UX1IL	5,355
WP4LNY	5,336
KC3LV	5,184
AH7R	4,329
N2ALE/6	4,150
F8BQQ	3,807
F6GVK	3,328
KJ5SF	2,847
OZ1AA	2,450
EA4BNQ	2,183
OE1KTS	1,426
SM7BGE	1,100
SP2EIW	73

Check Logs: LA8UU, VK3EBP, KI7KO, ER1PK, EA7AGW, SP9NWB, UA0FDX, RW0BG, W3FQE, HA8SE, SP7ICE, SP9UNX, SP9UND, N5LUQ, DH7AMF, K3SWZ, W9WI, EA7CWA, EA7ESH, G4EMT, LA2DT, SM6LJP, SP5OXJ, KI5FJ, F1176, W4NTI, SP6BSL, SP2GWZ, YO5BYV, OK1MKI, AA5RF, W4PK, UT9NA, UA9XK, ER1LW, SP2UUU, ON4APU, SP2YRY/2, UA9JMS, YU7AL, SP6NVK, DJ3AD, YB0UNC, JK1IQK, K1NU, SP5ZCC

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DSP HF Radio Modem

CLOVER-II, RTTY, AMTOR, P-Mode

NEW DXPWin Version 2.6.1

The **DXP38** is a stand-alone DSP HF Modem featuring a built-in tuning indicator with selectable Crossed X and Center Tuning displays. Multi-screen, menu-driven HAL software for both DOS and Windows (95, 98, NT 4.0) is included with each **DXP38** modem.

Installing the **DXP38** is easy. Connect a standard DB9 serial cable to your PC and three phono cables to your radio, hook up 12 VDC, and install the software. Now you are ready for some serious HF digital communications with sharp DSP filtering and Motorola microprocessor control. You win with the **DXP38**.

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